

From this reason, and owing to the proportionally slight difficulties attached to it, the graphical adjustment becomes particularly suitable where we are to lay down new empirical laws. In such cases we have to work through, to check, and to reject series of hypotheses as to the functional interdependency of observations and their essential circumstances. We save much labour, and illustrate our results, if we work by graphical adjustment.

Of course, we are not obliged to subject observations to adjustment. In the preliminary stages, or as long as it is doubtful whether a greater number of essential circumstances ought not to be taken into consideration, it may even be the best thing to give the observations just as they are.

But if we use the graphical form in order to illustrate such statements by the drawing of a line which connects the several observed points, then we ought to give this line the form of a continuous curve and not, according to a fashion which unfortunately is widely spread, the form of a rectilinear polygon which is broken in every observed point. Discontinuity in the curve is such a marked geometrical peculiarity that it ought, even more than cusps, double-points, and asymptotes, to be reserved for those cases in which the author expressly wants to give his opinion on its occurrence in reality.

XIV. THE THEORY OF PROBABILITY.

§ 65. We have already, in § 9, defined "*probability*" as the limit to which — the law of the large numbers taken for granted — the relative frequency of an event approaches, when the number of repetitions is increasing indefinitely; or in other words, as the limit of the ratio of the number of favourable events to the total number of trials.

The theory of probabilities treats especially of such observations whose events cannot be naturally or immediately expressed in numbers. But there is no compulsion in this limitation. When an observation can result in different numerical values, then for each of these events we may very well speak of its probability, imagining as the opposite event all the other possible ones. In this way the theory of probabilities has served as the constant foundation of the theory of observation as a whole.

But, on the other hand, it is important to notice that the determination of the law of errors by symmetrical functions may also be employed in the non-numerical cases without the intervention of the notion of probability. For as we can always indicate the mutually complementary opposite events as the "fortunate" or "unfortunate" one, or as "Yes" and "No", we may also use the numbers 0 and 1 as such a formal indication. If